

Section 3

Additional Resources

TO: Practicing Veterinarians

FROM: State Veterinarian's Office

This protocol for investigation of a foreign animal disease (FAD) gives the emergency response contact numbers that can be used for all reportable diseases (including anthrax).

Missouri Emergency Response Protocol for Reporting a Foreign Animal Disease

Emergency Response Plan: This plan is for dealing with all foreign animal diseases, including foot-and-mouth disease. The goal of this plan is to detect, control, and eradicate all intentional (agrorterrorism) or accidental introduction of the disease. This plan considers presumptive positive cases and confirmed positive cases of any foreign animal disease.

I. Foreign Animal Diseases, including vesicular diseases in cloven-hoofed animals, will be handled as an animal disease emergency. Any practicing veterinarian that suspects a foreign animal disease, including foot-and-mouth disease (FMD), will notify the State Veterinarian's Office at (573) 751-3377 or cell phones (573) 578-8837, (573) 690-2831, and (573) 694-7515 or contact the State Emergency Management Agency (SEMA) 24-hour duty officer at (573) 751-2748.

II. Any case with an animal exhibiting clinical signs consistent with a foreign animal disease will be reported to the office of the State Veterinarian and/or the USDA Area Veterinarian In Charge (AVIC). The State Veterinarian will immediately dispatch a Foreign Animal Disease Diagnostician (FADD) to the premises. If the reporting veterinarian, based on clinical experience and reasonable judgment, determines that the disease is highly suspicious of an FAD, the State Veterinarian or APHIS Area Veterinarian in Charge may authorize an interim quarantine of the premises by telephone to the reporting veterinarian. The FADD will assess the situation upon arrival at the premises and may confirm the quarantine of the premises should the situation warrant such action in his/her opinion. The FADD will also collect appropriate samples for laboratory analysis. Any veterinarian reporting such an incident must remain on the premises until released by the FADD. The samples will be examined immediately and

with the highest priority. Samples will be submitted to the laboratory within 24 hours after the beginning of the investigation. The FADD will use clinical signs, history, and professional experience to assess the risk of the disease. Categories of risk will be assigned as (1) Unlikely, (2) Possible, or (3) Highly Likely.

"Unlikely" or "Possible" Risk

- (1) An official state quarantine will be issued until the laboratory result rules out the foreign animal disease.
- (2) If the laboratory test is negative the animals will be released from quarantine.

"Highly Likely" Risk

- (1) FADD will immediately contact and consult with the AVIC and State Veterinarian.
- (2) The submitted samples will be given the highest priority to reach a diagnosis within 24 hours.
- (3) A quarantine will be placed on the farm of the index herd.
- (4) The FADD will work with the producer on appropriate biosecurity and public health measures.
- (5) A movement control zone quarantine of six miles will be placed around the index farm.
- (6) Producers on adjacent farms will be notified of the movement control zone quarantine by other regulatory personnel (not the FADD).

The State Veterinarian will take the following actions:

- (1) Notify Director, Missouri Department of Agriculture, of the suspicious case.
- (2) Consider stopping movement of all animals within the state.
- (3) Notify all field veterinarians, State Emergency Management Agency (SEMA), Food Safety and Inspection Service (FSIS), University Extension, and livestock industry partners.
- (4) Prepare a press release and notify the Missouri Veterinary Medical Association.

III. A presumptive positive case (animal with clinical signs and initial laboratory positive test for the agent) will initiate the following actions:

(1) State Veterinarian and AVIC will:

- Stop all movement of susceptible species of livestock in the state for 72 hours.
- Initiate depopulation and disposal of infected herd(s). Identified burial sites will be selected to minimize negative environmental impact.
- Provide information to the Missouri Department of Natural Resources on the plan to dispose of dead animals.
- Keep accurate records of depopulated animals for possible indemnity payments at a later time.
- Coordinate with SEMA to achieve Governor's Declaration of Emergency.
- Continue quarantine and movement restrictions.
- Continue active epidemiological investigation and surveillance to detect new cases.
- If appropriate, make decision on use of foot-and-mouth disease (FMD) vaccine to control disease.

(2) SEMA Director will:

- Activate State Emergency Response Plan.
- Assist with coordination of movement control within the State.
- Coordinate with FEMA on Federal Emergency Response Plan Activation.

(3) USDA, APHIS will:

- Activate the National Incident Management System (NIMS).
- Coordinate with other federal agencies on emergency declaration.
- Impose a federal quarantine on the state for interstate commerce.
- Cooperate with the State Veterinarian in identification of a source of infection.
- Coordinate national surveillance.

Reportable Diseases and Follow-Up Guidelines

I. Animal and Livestock Diseases

Reportable Communicable Diseases

The following are diseases that must be reported to state (573) 751-3377 or federal (573) 636-3116 agriculture officials within 24 hours of suspicion or diagnosis:

Avian

- Avian infectious encephalomyelitis
- Avian influenza
- Fowl typhoid (*salmonella gallinarum*)
- Infectious laryngotracheitis
- *Mycoplasma gallisepticum* (MG)
- *Mycoplasma meleagridis* (MM)
- *Mycoplasma synoviae* (MS)
- Paramyxovirus infection (other than Newcastle Disease)
- Psittacosis (chlamydiosis and ornithosis)
- Pullorum disease (*salmonella pullorum*)
- Salmonellosis caused by *Salmonella enteritidis*
- Velogenic viscerotropic Newcastle disease

Bovine

- Akabane
- Anthrax
- Bluetongue
- Bovine babesiosis (Texas fever, piroplasmosis)
- Bovine spongiform encephalopathy (BSE)
- Brucellosis
- Contagious bovine pleuropneumonia
- East Coast fever (coastal fever, theileriosis)
- Ephemeral fever (three-day sickness)
- Foot-and-mouth disease
- Gonderiosis (theileriosis)
- Heartwater
- Hemorrhagic septicemia (Asiatic type 1 shipping fever)
- Ibaraki
- Infectious petechial fever

- Louping Ill
- Lumpy skin disease (pseudourticaria)
- Malignant catarrhal fever
- Paratuberculosis
- Pseudorabies
- Q fever
- Rift Valley fever
- Rinderpest (cattle plague)
- Scabies
- Screwworm
- Sweating sickness (tick-borne toxicosis)
- Tuberculosis
- Trypanosomiasis (nagana)
- Vesicular stomatitis
- Wesselborne disease

Caprine-Ovine

- Bluetongue
- Borna disease
- Brucellosis caused by *Brucella melitensis* and *B. ovis*
- Caseous lymphadenitis
- Contagious agalactia of sheep and goats
- Contagious caprine pleuropneumonia
- Foot-and-mouth disease
- Goat and sheep pox
- Gonderiosis (theileriosis)
- Heartwater
- Nairobi sheep disease
- Peste des petits ruminants (kata)
- Screwworm
- Tuberculosis
- Rift Valley fever
- Scabies
- Scrapie
- Vesicular stomatitis
- Visna-Maedi (chronic progressive pneumonia)

Equine

- African Horse sickness
- Babesiosis (piroplasmosis)
- Contagious equine metritis
- Dourine (equine trypanosomiasis)
- Eastern equine encephalomyelitis
- Epizootic lymphangitis
- Equine infectious anemia (EIA)
- Equine piroplasmosis
- Equine rhinopneumonitis
- Equine viral arteritis
- Glanders
- Potomac horse fever
- Venezuelan equine encephalomyelitis
- Vesicular stomatitis
- Western equine encephalomyelitis

All Species

- Anthrax
- Brucellosis
- Exotic myiasis
- Foot-and-mouth disease
- Paratuberculosis (Johne's disease)
- Rabies
- Tuberculosis
- Vesicular exanthema
- Vesicular stomatitis

Porcine

- African swine fever
- Brucellosis
- Foot-and-mouth disease
- Hog cholera
- Porcine babesiosis
- Pseudorabies
- Swine vesicular disease
- Teschen disease (porcine encephalomyelitis)
- Vesicular exanthema
- Vesicular stomatitis

Cervidae

- Chronic Wasting Disease (CWD)

II. Communicable Diseases

The following must be reported to the local public health agency or the Missouri Department of Health and Senior Services during business hours at (573) 751-9071 or after hours/weekends at 800-392-0272 within 24 hours of suspicion or diagnosis:

- Rabies, animal or human

III. Disease From Potential Agents of Bioterrorism:

These diseases are divided into three categories of decreasing priority. Some are considered to be "foreign animal diseases" (e.g., Venezuelan equine encephalomyelitis), and most are zoonotic. A number of these diseases are reportable to state or federal agriculture officials, as noted above. All diseases (animal or human) suspected to have resulted from an act of bioterrorism must be reported immediately to (1) state (573) 751-3377 or federal (573) 636-3116 agriculture officials and/or (2) the Missouri Department of Health and Senior Services (business hours: 573-751-9071; after hours/weekends: 800-392-0272).

Category A

- Anthrax (*Bacillus anthracis*)
- Botulism (*Clostridium botulinum* toxin)
- Plague (*Yersinia pestis*)
- Smallpox (*Variola major*)
- Tularemia (*Francisella tularensis*)
- Viral Hemorrhagic Fevers (Ebola, Marburg, Lassa, Machupo)

Category B

- Brucellosis (*Brucella* species)
- Glanders (*Burkholderia mallei*)
- Melioidosis (*Burkholderia pseudomallei*)
- Psittacosis (*Chlamydophila psittaci*)
- Q Fever (*Coxiella burnetii*)

- Typhus Fever (*Rickettsia prowazekii*)
- Viral Encephalitis (VEE, EEE, WEE)
- Toxins (*Ricinus communis*, *Clostridium perfringens*, *Staphylococcus aureus*)

Category C

- Nipah (Nipah virus)
- Hantavirus (Hantavirus)

IV. Recommendations for Veterinarians

Examining Animals With Suspected Foreign Animal Disease or Disease Resulting From an Act of Bioterrorism

Veterinarians who examine or treat animals with suspected foreign animal disease (FAD) or disease resulting from an act of bioterrorism (BT) should use infection control precautions to protect the health of themselves, staff, and clients, as well as other animal patients in the area. Generally, animals suspected of having a FAD/BT disease should not be moved from their home premises. If a tentative diagnosis of FAD/BT disease is not made until the animal is brought to a clinic, the animal should be isolated immediately. In either event, veterinarians and staff should wear personal protective equipment (PPE) during the examination. The animal should not be taken to a common treatment room, and all treatments and diagnostics should be performed in the examination room. The number of staff allowed in the exam room and that come in contact with the animal should be limited to as few persons as possible. Veterinarians who do not wish to examine an animal with suspected FAD/BT disease should advise the animal's owner to contact the state agriculture or health department for further guidance.

Infection Control Precautions

The most common routes for transmission of FAD/BT diseases are through direct contact with infected animals and by airborne spread. In addition, all avenues of transmission for some of these agents are not totally understood. When examining animals with suspected FAD/BT disease, veterinarians and staff should use the following precautions:

1. Hand hygiene after all contact with a sick animal and contaminated surfaces.
2. Use of gown and gloves for any contact with the sick animal and contaminated surfaces.
3. Eye protection (e.g., tight-fitting goggles or face shield) if splash or spray of body fluids is likely.
4. Respiratory protection, including a NIOSH-certified N95 filtering disposable respirator (or other respirator offering comparable levels of respiratory protection), for entering the exam room or patient care area. If N95 or comparable respirators are not available, then surgical masks should be worn to protect against transmission through contact or large droplets.
5. Contain and dispose of contaminated waste after consultation with state or local health officials. Do not dispose of waste in landfills or dumps.
6. Handle used patient-care equipment in a manner that prevents contamination of skin and clothing. Ensure that used equipment has been cleaned and reprocessed appropriately.
7. Ensure that procedures are in place for cleaning and disinfecting contaminated environmental surfaces. EPA-registered detergent-disinfectants currently used by healthcare or veterinary facilities for environmental sanitation may be used. Manufacturer's recommendations for dilution (i.e., concentration), contact time, and care in handling should be followed.
8. Handling of laundry (e.g., towels, clothing) should be evaluated on a case-by-case basis. For many agents, laundry may be washed in a standard washing machine with hot water and detergent. The use of chlorine bleach during hot-water washing can provide an added measure of safety. Washing laundry contaminated with a resistant form of an organism (e.g., spore formers) may not be sufficient. The state agriculture or health department may be

consulted for guidance. Care should be used when handling soiled laundry to avoid direct contact with contaminated material. Soiled laundry should not be shaken or otherwise handled in a manner that may aerosolize infectious particles.

V. Risk Communication

In the event of a FAD/BT disease, it is highly advisable not to talk to media or to release information to other individuals or agencies that do not have the “need to know.” It is important that information be communicated accurately and in a timely manner to the media, public, and decision-makers, but this is best accomplished by using public information resources available through state and federal agencies. Failure to control the message could result in misinterpretation of data, distortion of events, and information being taken out of context.

General Signs of Reportable Animal and Poultry Diseases

I. Vesicles/erosions on tongue, nose, lips, feet, teats

- Foot-and-mouth disease
- Vesicular stomatitis
- Swine vesicular disease
- Bluetongue of cattle
- Sore mouth (contagious ecthyma) of sheep and goats
- Bovine virus diarrhea
- Malignant catarrhal fever
- Vesicular exanthema of swine
- Rinderpest
- Contagious foot rot of sheep

II. High herd/flock morbidity, low fatality

- Foot-and-mouth disease
 - Cattle, swine, sheep, goats, all cloven hoofed susceptible
 - Does not occur in horses
 - 100 percent herd incidence in the U.S.
 - Less than 1 percent fatality, higher in calves
- Vesicular stomatitis
 - Higher morbidity and more severe in horses than cattle or swine
 - Lower morbidity and severity in cattle and swine than FMD
 - Sheep and goats rarely infected

III. High herd/flock morbidity, high fatality

- Hog cholera
- African swine fever
 - Eradicated from Western Hemisphere
 - Virus with lower virulence has emerged
- Exotic Newcastle disease
- High pathogenic avian influenza
- Rift Valley fever (morbidity and fatality variable among outbreaks)
- Rinderpest

IV. Low morbidity, high fatality

- Anthrax
- Scrapie
- Bovine spongiform encephalopathy

- Chronic wasting disease

V. Abortion storms not associated with known pathogens for the location

- Rift Valley fever, early sign in sheep and cattle, may be sentinels for impending human disease
- Q fever, abortions of sheep, goats and cattle, late pregnancy, usually the only sign in animals, shorter incubation than disease in humans so may precede human disease
- Brucella abortus in cattle (always remain vigilant!)

VI. Unusual respiratory sounds in a poultry house

- Avian influenza
- Exotic Newcastle disease

VII. Acute onset, rapid infection

- Foot-and-mouth disease
- Hog cholera
- Rift Valley fever
- African swine fever
- Swine vesicular disease
- Rinderpest

VIII. Central nervous system signs

- Viral encephalidities (eastern, western, Venezuelan, West Nile)
- Hog cholera
- Scrapie
- Bovine spongiform encephalopathy
- Botulism

IX. Fly larvae (maggots) in living tissue

- Screwworms

X. Sudden death without clinical signs

- Anthrax
- Rinderpest

Missouri Veterinary Medical Association
Emergency Management and Public Health Committee

Biosecurity of Veterinary Practices

Practitioners, their staffs and technicians must be aware of the clinical signs of the important foreign animal diseases so that they are able to suspect a potentially dangerous disease seen on a farm call, in the clinic or by client description over the telephone. Education of veterinarians and staffs should focus on vesicular diseases, all of which are reportable, hog cholera, which might look like any other highly contagious and deadly swine disease, highly contagious poultry diseases and anthrax.

Clinic and Hospital Biosecurity

- Carefully screen new employees; double check education and employment histories.
- Be aware of repeated visits by strangers and unrecognized vehicles in the vicinity.
- Build a perimeter fence; possibly install a security system
- Limit internal traffic between large animal and small animal facilities; place disinfectant tubs with boot brushes for use between facilities.
- Carefully screen unknown visitors, prohibit entry to animal facilities and be aware of animal extremist organizations.
- Livestock arriving at the large animal facility should be observed for signs of obvious abnormalities before unloading.
- Emergency contact phone numbers should be posted in the clinic and carried in practice vehicles. A wallet-size card with these contact numbers was mailed to all veterinarians in Missouri by the MVMA.

Vehicle and Livestock Facility Biosecurity

- Wear clean outer clothing and disinfect boots when entering and leaving livestock facilities. Livestock producers expect this level of biosecurity.
- Carry Virkon-S disinfectant, boot tub and brush, clean coveralls, disposable nitrile gloves, surgical masks and caps, and a two-gallon garden sprayer for external disinfection of the vehicle if necessary.
- Boots must be brushed clean with disinfectant. It is very difficult to sterilize fecal material.
- When entering a premises where vesicular or other highly contagious disease is suspected, wear disposable coveralls and plastic overboots which can be left at the facility for burning or other disposal.
- Elasta-A-Boots are tough quality plastic disposable boots, about \$0.50 a pair, and Disposable Coveralls, about \$1.25 a pair, are available from Nasco and other farm supply outlets. These items should be routine equipment in vehicles and clinics.
- If a reportable disease is suspected it is best to park the practice vehicle at the farm perimeter.
- If a reportable disease is suspected, state authorities must be contacted immediately beginning with the State Veterinarian, followed by others in order as listed in "Contacts for Animal Emergencies" if necessary. The first contact should always be the Office of the State Veterinarian.
- After reporting the disease, the veterinarian should remain on the farm until the arrival of the Foreign Animal Disease Diagnostician (FADD)..
- Contaminated clothing should be placed in a heavy plastic bag and washed in hot water with mild bleach. Plastic coveralls and boots left at the suspect farm for burning or other disposal.
- Veterinarians should emphasize farm biosecurity to clients.



Missouri Veterinary Medical Association

Emergency Management and Public Health Committee

Suggestions to Protect Your Livestock Operation

Restrict human traffic to farmstead

- Have a secure perimeter fence, limit entry to one gate.
- Post a sign forbidding entry without permission. Have visitors sign a register.
- Be aware of repeat sightings of unknown persons and vehicles near the farm
- Supply a tub of disinfectant, freshen daily, and a brush for scrubbing footwear.
- Provide plastic over-boots for visitors.
- Footwear worn away from the farmstead to any place where livestock are present should be scrubbed and disinfected before reentering the farm.

Restrict vehicle entry to farmstead

- Stop all nonessential vehicles from entering the farm and arrange whenever possible for collection and delivery of supplies to take place at farm boundary.
- If a vehicle must enter the farmstead make sure that prior to entry their wheels are sprayed with disinfectant.
- Livestock haulers should clean, disinfect and let dry as long as possible between loads.
- Identify an off-farm site for the livestock farm delivery and commercial pickup of animals for rendering.
- Keep a record of all deliveries. In the event of a disease being confirmed this may help in identifying the source.
- Ensure that sources of feed and bedding are protected and that samples of delivered feed are “banked” for future analysis in case of an animal disease outbreak.

Keep record of stock movement onto and off the farm

- Participate in the premises and livestock identification program.
- Verify health and origin of purchased livestock.
- New stock entering the herd should be quarantined, observed for 30 days and tested as suggested by your veterinarian prior to entry.
- Keep complete records of all stock movement onto and off of the farm.
- Each farm premises must be treated as a separate unit; record animal movement between units.
- Avoid contact of your farm animals with those of your neighbors.

Keep dogs, cats, birds, wild game and vermin under control

Since other animals and birds can serve as a source of disease entering the herd it is vitally important to make every effort for their elimination or control.

Provide for family and animal health and comfort

The farm should have an emergency 3-day supply of food and drinking water and feed for animals and poultry.

Report any unusual signs of animal sickness or death to your veterinarian.



Disinfection of Premises and Fomites

First, remove organic matter; scrub with soap and water.

Virkon S

- The only disinfectant labeled for foot-and-mouth disease. Works fairly well in organic matter
- Effective against hog cholera virus, many other viruses, bacteria, and fungi.
- Needs 5 – 10 minutes contact time, long activity on hard surfaces
- Comes as a powder, follow directions for 1 percent solution for all uses
- Should be mixed fresh, lasts about five days, color changes when losing potency, test strips included

Bleach/Hypochlorite

- 3 percent dilution, 1/2 cup to 1 gallon water, mix fresh for each use
- Effective against FMD and hog cholera viruses and most other viruses, bacteria, fungi, and spores; requires 10 minutes contact time, inactivated by organic matter
- Inexpensive, Clorox best brand for use

Iodophores and Iodine

- Not effective against foot-and-mouth virus
- Kills most viruses, bacteria, and fungi; inactivated by organic matter
- Requires 10 minutes, contact time
- Questionable efficacy against hog cholera and other swine viruses
- Expensive

Chlorhexidine; Nolvasan

- Questionable effect against FMD virus, not effective against some other bacteria and viruses, not effective against spores
- Requires 10-minute contact time
- Inactivated by organic material

Quaternary Ammonium Compounds

- Roccal D or Roccal
- Not effective against FMD virus; otherwise, kills a wide range of bacteria, viruses, and fungi; does not kill spores
- Requires 10 minutes, contact time
- Works well in organic matter at neutral or high pH
- May be combined with detergents
- Toxic to cats

White Vinegar

- Use 1 gallon per gallon water, works well against FMD virus
- 5-minute contact time

Sodium Carbonate (soda ash, washing soda)

- Strong alkalizing agent
- Effective in dry powder form or as 4 percent solution to disinfect FMD virus-contaminated barns, pens corrals, etc.; caution when applying (surgical mask, coveralls, gloves)



Vesicular Diseases Reference Chart

	Foot & Mouth Disease	Vesicular Stomatitis	Swine Vesicular Disease	Vesicular Exanthema of Swine
Importance	These 4 diseases are clinically indistinguishable from each other, particularly in swine.			
Incubation Period	Ingestion 1-3 days; Exposure 3-5 days	Animals 3-5 (up to 21) days; Humans 24-48 hours	Ingestion 2-3 days; Exposure 2-7 days	18-72 hours
Clinical Signs by Species	All vesicular diseases produce a fever with vesicles that progress to erosions in the mouth, nares, muzzle, teats, and feet			
Cattle	<i>Disease Indicators</i> Oral & hoof lesions; salivation; drooling; lameness; abortions; death in young animals; "panthers"	Vesicles in oral cavity, mammary glands, coronary bands, interdigital space	Not affected	Not affected
Pigs	<i>Amplifying Hosts</i> Severe hoof lesions; hoof sloughing; snout vesicles; less severe oral lesions	Same as cattle	Severe signs in animals housed on concrete; lameness; salivation; neurological signs; more severe in young	Deeper lesions with formation of granulation tissue on the feet
Sheep & Goats	<i>Maintenance Hosts</i> Mild signs if any	Rarely show signs	Not affected	Not affected
Horses, Donkeys, Mules	Not affected	Most severe with oral and coronary band vesicles; drooling; rub mouths on objects; lameness	Not affected	Not affected
Humans	Not common	Flu-like signs, headache, rare oral blisters	Not affected	Seroconversion and mild clinical disease of meningitis in one lab worker
Clinical Summary	Salivation and lameness with vesicles; Equidae not affected	Horses are affected; less contagious so spread is slower; lesions in one area of body	Pigs only; mild lesions; no mortality	Pigs only; deeper lesions; low mortality
Sample Collection	Before collecting or sending any samples, the proper authorities should be contacted. Samples should only be sent under secure conditions to authorized laboratories to prevent spread.			
Prefer	Epithelium from unruptured or recently ruptured vesicles in proper medium			
Additional samples/tissues	Esophageal-pharyngeal fluid (cattle) or throat swab (pigs); 5ml blood with anticoagulant; 10ml for serum; lymph nodes; thyroid, adrenal gland, kidney, heart; in formalin	Vesicular fluid collected aseptically and frozen	Vesicular fluid collected aseptically and frozen; undiluted whole blood from febrile animals; focal and serum samples from infected and noninfected animals	Vesicular fluid collected aseptically and frozen; undiluted whole blood from febrile animals; fecal and serum samples from infected and noninfected animals
Notification	State & Federal Veterinarians should be contacted IMMEDIATELY and informed of suspicions			
Quarantine	State & Federal Veterinarians should be contacted IMMEDIATELY and informed of suspicions			

Vesicular Diseases Reference Chart-Additional Information

	Foot & Mouth Disease	Vesicular Stomatitis	Swine Vesicular Disease	Vesicular Exanthema of Swine
Etiology	Aphthovirus	Vesiculovirus	Enterovirus	Calicivirus
Geographic Distribution	Endemic in Asia, Africa, Middle East, parts of S.Amer; US free since 1929	N & Central Amer, northern South Amer	Many European countries	U.S. only (eradicated in 1956)
Transmission	Respiratory aerosols; direct and indirect contact	Insect vectors (sand & black flies); contact, aerosol in humans	Ingestion of contaminated meat; contact with animals, feces	Ingestion of pork contaminated, uncooked garbage
Post-Mortem Lesions	Single or multiple vesicles, ruptured vesicles with demarcation line, "dry" lesions in pig oral cavity, coronitis, hoof wall separation, "Tiger heart" lesions, rumen pillar lesions	Similar to FMD, but without heart and rumen lesions	Similar to FMD	Similar to FMD
Differentials	Rinderpest, Bovine Herpes Virus 1 (IBR), BVD, Bovine Papular stomatitis, Malignant Catarrhal Fever, Bluetongue, Contagious Ecthyma, lip and leg ulceration, foot rot, chemical and thermal burns.			
Morbidity & Mortality	Morbidity 100%; Mortality less than 1%, severe in young	Morbidity varies, up to 90%; Mortality low; death in young less common	Morbidity is low; lesions less severe; Mortality not a concern	Morbidity varies, up to 100%; Mortality is low
Sample Packaging	Caution with dry ice as carbon dioxide will inactivate the virus	Virus inactivated by 1% formalin		
Disinfection	2% sodium hydroxide (lye), 4% sodium carbonate, 0.2% citric acid; Resistant to iodophores, quaternary ammonium compounds, hypochlorite and phenol, especially with organic matter present.	2% sodium hydroxide (lye), 4% sodium carbonate, 2% iodophores, chlorine dioxide	10% formalin, 2% sodium hydroxide (lye), iodophores, chlorine dioxide	<i>Organic matter:</i> 1% sodium hydroxide combined with detergent <i>No Organic Matter:</i> oxidizing agents and iodophores with detergents
Prevention & Control	Destroy litter and susceptible animal products	Control insects, no movement of animals from farm for 30 days		

Exotic Newcastle Disease and Highly Pathogenic Avian Influenza Reference Chart

	Exotic Newcastle Disease (END) 	Highly Pathogenic Avian Influenza (HPAI) 
Importance	Highly contagious, often fatal disease	
Organism	<i>Avian paramyxovirus-1</i>	Type A Influenza virus, Orthomyxovirus; Classified by surface antigens H and N
Clinical Signs in Birds	END and HPAI are clinically indistinguishable from each other Respiratory: Coughing, sneezing, nasal discharge Digestive: Watery diarrhea Nervous: Depression, ataxia, torticollis Sudden death without clinical signs, decreased egg production, thin-shelled eggs	
Clinical Signs in Humans	Mild conjunctivitis	Mild to fatal disease
Transmission	Spread by feces and respiratory discharges, direct contact, aerosolization and fomites.	
Differential Diagnosis	Poultry: HPAI, fowl cholera, infectious coryza, fowl pox, avian chlamydiosis, infectious laryngotracheitis, mycoplasmosis, infectious bronchitis, management problems. Psittacines: Avian chlamydiosis, Pacheco's disease, avian influenza, salmonellosis, toxicosis.	END, infectious laryngotracheitis, acute bacterial diseases (eg, fowl cholera and <i>E. coli</i> infections)
Morbidity/Mortality	Mortality can reach 100%; Morbidity can reach 90%	Mortality can reach 100%; Morbidity can reach 100%
Diagnosis	Virus isolation required for definitive diagnosis	
Sample Collection	Before collecting or sending any samples, the proper authorities should be contacted. Samples should only be sent under secure conditions to authorized laboratories to prevent spread.	
Prefer	Tracheal or cloacal swabs from live or dead birds, as well as feces.	
Notification	State & Federal Veterinarians should be contacted IMMEDIATELY and informed of suspicions	
Quarantine	Suspected animals, areas, farms will be quarantined by the state veterinarian.	
Vaccination	Routine in poultry flocks. Will not prevent infection or virus shedding.	Costly; no cross protection; may result in reassortment viruses. Inactivated H5 vaccine licensed in US for emergency use
Disinfection	Virus killed by extremes of pH, heat, dryness, phenolics (eg, One Stroke Environ), oxidizing agents (eg, Virkon) and quaternary ammonium compounds (eg, Roccal-D Plus) Halogens (eg, 6% household bleach) Biguanides (eg, Nelvasan-5) Ultraviolet and sunlight	Aldehydes in presence of organic matter Dilute acids (eg, paracetic acid)